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LIGHTNING Safety



Did you know that lightning has been observed on Venus, Jupiter, Saturn, and and it may occur on other planets?

Did you know that you can be struck by lightning from a storm that is 10 miles away?

Every year dozens of people are killed or injured by lightning across the United States.

The author wishes to thank the NWS employees who contributed

Lightning receives far less attention and makes far fewer headlines than hurricanes, tornadoes, and floods because it takes its victims one at a time. Lightning is the most frequent important weather threat to personal safety during the thunderstorm season.

FACTS

The most dangerous time of the year is between late Spring and early Autumn with July having the most fatalities. Most of these occur between the hours of 10 am and 7 pm when people are engaging in outdoor activities.

Though your chances are 1 in 600,000 of being struck by lightning if you are male and between the ages of 20-40 you are 3-9 times more likely to be killed by lightning than a female. Between the years 1940-1991 over 8,316 people have been killed by lightning making it the leading cause of weather related deaths in the United States.

The United States has the most thunderstorms in the world with over 100,000. China comes in second with 85,000 and at any given moment there is an estimated 2,000 thunderstorms underway around the world.



There are two types of lightning

1. Cloud -to- ground
2. Cloud -to- cloud or in-cloud.

Each year in the United States there are at least 100 million flashes of both types, 20 million of which strike the ground. A typical storm can produce over 15,000 lightning strikes to the ground in a 6 hour period. Causing over 100 million dollars in damage annually in the United States.

Lightning hits the ground 100 times each second or 8 million times a day

Any object has the potential of being struck by lightning , especially if it protrudes above ground.

It is true that you can be struck by lightning from a storm that is 10 miles away, but you are somewhat safer the further away the storm is. One way to determine this is called the *flash-bang method*. Light travels enormously fast compared to sound and this can be used to estimate the distance between you and a storm.

- ▶ see the flash
- ▶ count the seconds until you hear the bang of thunder
- ▶ divide by 5

The result is an estimate of the distance in miles from you to the storm.

What is thunder?

Thunder is produced when air around the lightning channel is superheated in less than a second from 15,000 to 60,000 °F (8,000-33,000°C). When air is heated this quickly it explodes and that is the sound we hear. We can usually hear thunder up to an average of 10 miles in distance, however during heavy rain and wind this distance may be reduced.



How much energy is in a thunderstorm?

A thunderstorm can produce several hundred megawatts of energy which is comparable to the output of a small nuclear power plant. Each flash has 1 billion volts of energy with a current between 10,000 and 200,000 amperes. An average lightning flash could light a 100 watt bulb for more than 3 months. With all this energy it would be wonderful if we could harness it in some way, unfortunately that is not feasible. The first problem is the flash would need to be in an exact spot and secondly there is so much energy

released in such a small amount of time that any equipment we would use to try and capture it would be damaged

Life Cycle of a Thunderstorm

The life cycle of a thunderstorm can be anywhere from 30 minutes to 12 hours and each storm goes through 3 distinct phases.

1. Growth

Towering cumulus clouds grow upward more rapidly than horizontally. Electrical activity starts when cloud temperatures are between +5 and -5 °F (-15 to -20°C).

2. Mature

The clouds are now cumulonimbus with an anvil shaped top. Precipitation drops form. A storm can reach this stage in less than half an hour. The first lightning flashes appear which may actually reach the ground before the rain. This is the most intense stage of the storm with the most precipitation and electrical activity and strong up and down drafts.

3. Dissipation

The down drafts eventually spread out after they reach the ground. This cuts off the inflow of warm moist air that feeds the updrafts and the storm weakens. There may be a few last flashes which can be dangerous because the storm will appear to have died.

Lightning striking near a person is called a side flash and it can cause injury, blindness, deafness, or even death. The hazard depends on many factors including

- ⇒ distance to the strike point
- ⇒ strength of the electric field
- ⇒ soil conductivity (wet soil conducts better than dry)

A side flash can even happen indoors through telephones, electric appliances, and water pipes connected to sinks, showers and baths.



What Not To Do

DON'T.....

- ⊗ be the highest object
- ⊗ be in or near water
- ⊗ be under or near a tree
- ⊗ be near a vehicle
- ⊗ be near a home or building
- ⊗ be on a golf course, ballfield, or similar recreational site
- ⊗ stand near an antenna, tower, or pole
- ⊗ touch anything connected to plumbing or cables coming in from outside

What To Do

Do.....

- ☺ watch for signs of a thunderstorm that is starting to grow quickly
- ☺ be aware of National Weather Service's watches and warnings
- ☺ crouch on the balls of your feet with your head down don't lie flat
- ☺ go inside a sturdy building or into a vehicle with a solid metal top, remember not to touch any metal
- ☺ obtain a weather report each day before engaging in any outdoor activity
- ☺ know where the closest safety shelter is and how long it takes to get there.
- ☺ make sure you can get to shelter in short notice.
- ☺ be aware of other storms in the area and if any are predicted to grow or move into the area during your outdoor activities

Always remember that if you feel your hair or skin tingle, immediately crouch on the balls of your feet with your head down.

